

**IN THE CLAIMS**

The following listing of claims replaces all previous versions and listings of the claims:

**Claim 1. (Currently Amended)** A method of horizontally structured CAD/CAM manufacturing, comprising:

identifying a real-world blank for machining;

generating a virtual blank from a referenced set of geometries, the virtual blank corresponding to the real-world blank and lacking an associative relationship with a coordinate system;

creating a master process model that includesing a the virtual blank, generated from a referenced set of geometries, said the master process model lacking an associative relationship with the coordinate system, said virtual blank corresponding to said real-world blank;

virtual machining at least one manufacturing feature into said virtual blank, each of said at least one manufacturing feature exhibiting an associative relationship with said coordinate system; and

deriving manufacturing instructions from said master process model to create a real-world component by machining said manufacturing feature into the real-world blank.

**Claim 2. (Currently Amended)** The method of Claim 1 wherein said associative relationship exhibited between said at least one manufacturing feature and said coordinate system is a parent/child relationship.

**Claims 3 - 8. (Cancelled)**

**Claim 9. (Original)** The method of Claim 1 further comprising creating extracts from said master process model.

Claim 10. (Previously Presented) The method of Claim 9 wherein said extracts comprise replicated models of said master process model at various operations of said manufacturing instructions.

Claims 11 and 12. (Cancelled)

Claim 13. (Original) The method of Claim 9 wherein said extracts are used to generate manufacturing process sheets.

Claim 14. (Original) The method of Claim 1 wherein said virtual blank is positioned and oriented relative to said coordinate system.

Claim 15. (Previously Presented) The method of Claim 14 wherein said virtual blank is generated as a three dimensional parametric solid model from said reference set geometry.

Claim 16. (Previously Presented) The method of Claim 1 wherein said reference set geometry is defined by dimensional characteristics of a modeled part

Claim 17. (Previously Presented) The method of Claim 1 wherein said coordinate system comprises one or more datum planes.

Claim 18. (Currently Amended) The method of Claim 17 wherein said one or more datum planes comprises:

a first datum plane positioned and oriented relative to a reference;  
a second datum plane positioned and oriented relative to said reference; and  
a third datum plane positioned and oriented relative to said reference.

Claim 19. (Original) The method of Claim 18 wherein said first datum plane, said second datum plane, and said third datum plane are orthogonal.

**Claim 20. (Original)** The method of Claim 1 wherein said manufacturing instructions comprise process sheets.

**Claim 21. (Original)** The method of Claim 20 wherein said process sheets are linked with numerically controlled tools and a coordinate measuring machine.

**Claim 22. (Original)** The method of Claim 1 wherein said master process model is linked with numerically controlled tools and a coordinate measuring machine.

**Claims 23 - 43. (Cancelled)**

**Claim 44. (Currently Amended)** The method of Claim [44]1 further including modifying a link among a plurality of modeling elements.

**Claims 45 and 46. (Cancelled)**

**Claim 47. (Original)** The method of Claim 44 wherein said modifying comprises removing said link among said modeling elements.

**Claim 48. (Original)** The method of Claim 44 wherein said modifying comprises establishing said link among said modeling elements

**Claim 49. (Previously Presented)** The method of Claim 44 wherein said modifying links among modeling elements includes substituting another plurality of modeling elements for said plurality of modeling elements.

**Claim 50. (Currently Amended)** A real-world component created utilizing a method of horizontally structured CAD/CAM manufacturing, the method comprising:  
identifying a real-world blank for machining;

generating a virtual blank from a referenced set of geometries, the virtual blank corresponding to the real-world blank and lacking an associative relationship with a coordinate system;

creating a master process model that includes the virtual blank, the generated-from-a-referenced set of geometries, said master process model lacking an associative relationship with at the coordinate system; said virtual blank corresponding to said real-world blank;

virtual machining at least one manufacturing feature into said virtual blank, each of said at least one manufacturing feature exhibiting an associative relationship with said coordinate system; and

deriving manufacturing instructions from said master process model to create a real-world component by machining said manufacturing feature into the real-world blank.

Claim 51. (Currently Amended) The method of Claim 50 wherein said associative relationship exhibited between said at least one manufacturing feature and said coordinate system is a parent/child relationship.

Claims 52 - 57. (Cancelled)

Claim 58. (Original) The method of Claim 50 further comprising creating extracts from said master process model.

Claim 59. (Previously Presented) The method of Claim 58 wherein said extracts comprise replicated models of said master process model at various operations of said manufacturing instructions.

Claims 60 and 61. (Cancelled)

Claim 62. (Original) The method of Claim 58 wherein said extracts are used to generate manufacturing process sheets.

**Claim 63. (Original)** The method of Claim 50 wherein said virtual blank is positioned and oriented relative to said coordinate system.

**Claim 64. (Previously Presented)** The method of Claim 63 wherein said virtual blank is generated as a three dimensional parametric solid model from said reference set geometry.

**Claim 65. (Previously Presented)** The method of Claim 50 wherein said reference set geometry is defined by dimensional characteristics of a modeled part

**Claim 66. (Previously Presented)** The method of Claim 50 wherein said coordinate system comprises one or more datum planes.

**Claim 67. (Currently Amended)** The method of Claim 66 wherein said one or more datum planes comprises:

- a first datum plane positioned and oriented relative to a reference;
- a second datum plane positioned and oriented relative to said reference; and
- a third datum plane positioned and oriented relative to said reference.

**Claim 68. (Original)** The method of Claim 67 wherein said first datum plane, said second datum plane, and said third datum plane are orthogonal.

**Claim 69. (Original)** The method of Claim 50 wherein said manufacturing instructions comprise process sheets.

**Claim 70. (Original)** The method of Claim 69 wherein said process sheets are linked with numerically controlled tools and a coordinate measuring machine.

**Claim 71. (Original)** The method of Claim 50 wherein said master process model is linked with numerically controlled tools and a coordinate measuring machine.

**Claims 72 - 92. (Cancelled)**

Claim 93. (Previously Presented) The method of Claim 50 further including modifying a link among a plurality of modeling elements.

Claims 94 and 95. (Cancelled)

Claim 96. (Previously Presented) The method of Claim 93 wherein said modifying comprises removing said link among said modeling elements.

Claim 97. (Previously Presented) The method of Claim 93 wherein said modifying comprises establishing said link among said modeling elements.

Claim 98. (Previously Presented) The method of Claim 93 wherein said modifying links among modeling elements includes substituting another plurality of modeling elements for said plurality of modeling elements.

Claim 99. (Currently Amended) A storage medium encoded with a machine-readable computer program code for horizontally structured CAD/CAM manufacturing, said storage medium including instructions for causing a computer to implement a method comprising:

identifying a real-world blank for machining;

generating a virtual blank from a referenced set of geometries, the virtual blank corresponding to the real-world blank and lacking an associative relationship with a coordinate system;

creating a master process model that includesing a the virtual blank,  
the generated from a referenced set of geometries, said master process model lacking an  
associative relationship with thea coordinate system, said virtual blank corresponding to said  
real-world blank;

virtual machining at least one manufacturing feature into said virtual blank, each of said at least one manufacturing feature exhibiting an associative relationship with said coordinate system; and

deriving manufacturing instructions from said master process model to create a real-world component by machining said manufacturing feature into the real-world blank.

**Claim 100. (Currently Amended)** The storage medium of Claim 99 wherin said associative relationship exhibited between said at least one manufacturing feature and said coordinate system is a parent/child relationship.

**Claims 101 - 103. (Cancelled)**

**Claim 104. (Original)** The storage medium of Claim 99 further comprising creating extracts from said master process model.

**Claim 105. (Original)** The storage medium of Claim 99 wherin said virtual blank is positioned and oriented relative to said coordinate system.

**Claim 106. (Previously Presented)** The storage medium of Claim 105 wherin said virtual blank is generated as a three dimensional parametric solid model from said reference set geometry.

**Claim 107. (Previously Presented)** The storage medium of Claim 99 wherin said reference set geometry is defined by dimensional characteristics of a modeled part.

**Claim 108. (Previously Presented)** The storage medium of Claim 99 wherin said coordinate system comprises one or more datum planes.

**Claim 109. (Currently Amended)** The storage medium of Claim 108 wherin said one or more datum planes comprises:

- a first datum plane positioned and oriented relative to a reference;
- a second datum plane positioned and oriented relative to said reference; and
- a third datum plane positioned and oriented relative to said reference.

Claim 110. (Original) The storage medium of Claim 109 wherein said first datum plane, said second datum plane, and said third datum plane are orthogonal.

Claim 111. (Original) The storage medium of Claim 99 wherein said manufacturing instructions comprise process sheets.

Claim 112. (Original) The storage medium of Claim 111 wherein said process sheets are linked with numerically controlled tools and a coordinate measuring machine.

Claim 113. (Original) The storage medium of Claim 99 wherein said master process model is linked with numerically controlled tools and a coordinate measuring machine.

Claims 114 and 115. (Cancelled)

Claim 116. (Original) The storage medium of Claim 99 further including modifying a link among a plurality of modeling elements.

Claim 117 and 118. (Cancelled)

Claim 119. (Original) The storage medium of Claim 116 wherein said modifying comprises removing said link among said modeling elements.

Claim 120. (Original) The storage medium of Claim 116 wherein said modifying comprises establishing said link among said modeling elements.

Claim 121. (Previously Presented) The storage medium of Claim 116 wherein said modifying links among modeling elements includes substituting another plurality of modeling elements for said plurality of modeling elements.

Claim 122. (Currently Amended) A computer data signal tangibly embodied in a computer-readable medium and propagated over a transmission medium for communication with a computer, said signal including code configured to cause a computer to implement a method for horizontally structured CAD/CAM manufacturing (the method further comprising:

identifying a real-world blank for machining;

generating a virtual blank from a referenced set of geometries, the virtual blank corresponding to the real-world blank and lacking an associative relationship with a coordinate system;

creating a master process model that includesing a the virtual blank, the generated from a referenced set of geometries, said master process model lacking an associative relationship with athe coordinate system, said virtual blank corresponding to said real-world blank;

virtual machining at least one manufacturing feature into said virtual blank, each of said at least one manufacturing feature exhibiting an associative relationship with said coordinate system; and

deriving manufacturing instructions from said master process model to create a real-world component by machining said manufacturing feature into the real-world blank.

Claim 123. (Currently Amended) The computer data signal of Claim 122 wherein said associative relationship exhibited between said at least one manufacturing feature and said coordinate system is a parent/child relationship.

Claims 124 - 127. (Cancelled)

Claim 128. (Original) The computer data signal of Claim 122 further comprising creating extracts from said master process model.

Claim 129. (Original) The computer data signal of Claim 122 wherein said virtual blank is positioned and oriented relative to said coordinate system.

**Claim 130. (Previously Presented)** The computer data signal of Claim 129 wherein said virtual blank is generated as a three dimensional parametric solid model from a said reference set geometry.

**Claim 131. (Previously Presented)** The computer data signal of Claim 122 wherein said reference set geometry is defined by dimensional characteristics of a modeled part.

**Claim 132. (Previously Presented)** The computer data signal of Claim 122 wherein said coordinate system comprises one or more datum planes.

**Claim 133. (Currently Amended)** The computer data signal of Claim 132 wherein said one or more datum planes comprises:

- a first datum plane positioned and oriented relative to a reference;
- a second datum plane positioned and oriented relative to said reference; and
- a third datum plane positioned and oriented relative to said reference.

**Claim 134. (Original)** The computer data signal of Claim 133 wherein said first datum plane, said second datum plane, and said third datum plane are orthogonal.

**Claim 135. (Original)** The computer data signal of Claim 122 wherein said manufacturing instructions comprise process sheets.

**Claim 136. (Original)** The computer data signal of Claim 135 wherein said process sheets are linked with numerically controlled tools and a coordinate measuring machine.

**Claim 137. (Original)** The computer data signal of Claim 122 wherein said master process model is linked with numerically controlled tools and a coordinate measuring machine.